CLAIMS

1. A film for optical parts comprising a light transmission layer mainly composed of a thermoplastic resin, wherein an integrated value of the ratio of loss modulus to storage modulus in a temperature range of 30°C to 80°C as determined by a dynamic viscoelasticity measurement under a tensile stress mode at a frequency of 10 Hz with a heating rate of 3°C/min is 2 or more.

2. A film for optical parts comprising a light transmission layer mainly composed of a vinyl-base polymer, wherein an integrated value of the ratio of loss modulus to storage modulus in a temperature range of 30°C to 80°C as determined by a dynamic viscoelasticity measurement under a tensile stress mode at a frequency of 10 Hz with a heating rate of 3°C/min is 2 or more.

3. The film for optical parts according to Claim 2,

wherein the vinyl-base polymer comprises vinyl-base polymer A containing at least one kind of proton donating atomic groups in the molecule and vinyl-base polymer B containing at least one kind of proton accepting atomic groups in the molecule, and

wherein pseudo cross-links are formed between the proton donating atomic groups and proton accepting groups by intermolecular hydrogen bonds.

4. The film for optical parts according to Claim 3, wherein vinyl-base polymer A is a polymer obtained by polymerizing a mixture of monomers containing a vinyl monomer having at least one functional group selected from a carboxyl group, hydroxyl group and phenolic hydroxyl group in the molecule, and vinyl-base polymer B is a polymer obtained by polymerizing a mixture of monomers containing a vinyl monomer having nitrogen atoms in the molecule, and

wherein either vinyl-base polymer A or vinyl-base polymer B has a glass transition temperature of 25°C or more, and the other has a glass transition temperature of less than 25°C.

5. The film for optical parts according to Claim 1 or 2, wherein the thermoplastic resin or vinyl-base polymer is an acrylic resin.

6. The film for optical parts according to Claim 1 or 2, wherein the thermoplastic resin or vinyl-base polymer contains at least one compound selected from phenolic antioxidants, phosphite antioxidants, thioether antioxidants and light stabilizers.

7. The film for optical parts according to Claim 1 or 2, wherein a light transmittances at a wavelength of 405 nm is 87% or more.

8. The film for optical parts according to Claim 1 or 2, wherein a thickness of the light transmission layer is in the range of 15 to 250 μm and an accuracy of the thickness is within ±2.0 μm.

9. The film for optical parts according to Claim 1 or 2, wherein a birefringence of the light transmission layer is 20 nm or less.

10. The film for optical parts according to Claim 1 or 2, wherein a hard coat layer with a pencil hardness of 3H or more is formed on the light transmission layer.

11. The film for optical parts according to Claim 10, wherein the thickness of the hard coat layer is in the range of 0.5 to 8 μm and an accuracy of the thickness is within ±1.0μm.

12. The film for optical parts according to Claim 10, wherein the hard coat layer is a cross-linked structure.

13. The film for optical parts according to Claim 12, wherein the cross-linked structure is a silicon-base cross-linked structure or an acrylic cross-linked structure.

14. The film for optical parts according to Claim 10, wherein the hard coat layer contains 0.2 to 10.0% by weight of a silicone thermoplastic resin.

15. The film for optical parts according to Claim 1 or 2, further comprising a base layer laminated on the light transmission layer and removed by peeling at the time of use.

16. The film for optical parts according to Claim 15, wherein a peeling processing is carried out on a surface of the base layer which contacts the light transmission layer, and smoothness of the surface is 20 nm or less.

17. The film for optical parts according to Claim 15, wherein the light transmission layer contains the silicone resin.

18. The film for optical parts according to Claim 15, wherein the thermoplastic resin or vinyl resin of the light transmission layer contains 10% by weight or less of low molecular weight polymers with a molecular weight of 10,000 or less as converted into the molecular weight of standard polystyrene measured by gel permeation chromatography relative to the total amount of the polymer.

19. The optical film according to Claim 15, wherein the thermoplastic resin or vinyl resin of the light transmission layer is a vinyl-base polymer comprising at least a mixture of vinyl-base polymer A and vinyl-base polymer B having contradictory characteristics as well as different glass transition temperatures to one another, and

wherein either vinyl-base polymer A or vinyl-base polymer B having a glass transition temperature of 25°C or more has an average molecular weight of 70,000 or more as converted into the molecular weight of standard polyethylene.

20. The film for optical parts according to Claim 15, wherein the base layer essentially consists of a polyester resin.

21. The film for optical parts according to Claim 15, wherein the number of peeling residues after peeling the light transmission layer from the base layer under the conditions of a peeling speed of 100 mm/second at 25°C is 3 places or less per 1 m^2.

22. The film for optical parts according to Claim 15, wherein the static frictional coefficient of the light transmission layer against PET at 25°C is 0.42 or less.

23. The film for optical parts according to Claim 1 or 2, wherein an adhesive layer is formed on the light transmission layer.

24. The film for optical parts according to Claim 23, wherein a thickness of two layers of the light transmission layer and the adhesive layer is in the range of 30 to 300 μm and a accuracy of the thickness is within ±2.0 μm.

25. The film for optical parts according to Claim 1 or 2, wherein the light transmission layer is used for the light transmission layer of an optical disk.

26. A coiled film laminate, formed by winding the film for optical parts according to any one of Claims 1 to 25 into a roll shape.

27. An optical part, prepared by applying the film for optical parts according to any one of Claims 1 to 25 as the light transmission layer.

28. The optical part according to Claim 27, wherein the light transmission layer is bonded with interposition of the adhesive layer, and

wherein the difference of refractive index between the light transmission layer and adhesive layer is 0.1 or less.

29. The optical part according to Claim 27, wherein the optical part is an optical disk.

30. The optical part according to Claim 29, wherein the optical disk is a high density DVD and a recording capacity of the DVD is 20 GB or more.

31. An optical disk formed by sequentially laminating a recording layer, an adhesive layer and a light transmission layer on at least one surface of a supporting base plate, wherein a thermal expansion ratio as a ratio of the amount of unidirectional thermal expansion of the supporting base plate at 30°C to 80°C to the amount of unidirectional thermal expansion of the light transmission layer at 30°C to 80°C is in the range of 0.75 to 1.25, and

wherein the light transmission layer mainly comprises a thermoplastic resin.

32. The optical disk according to Claim 31, wherein a birefringence of the light transmission layer is 20 nm or less and a thickness of the light transmission is in the range of 15 μm to 250 μm.

33. The optical disk according to Claim 31, wherein a light transmittances of the light transmission layer at a wavelength of 405 nm is 87% or more.

34. The optical disk according to Claim 31, wherein the thermoplastic resin is a vinyl-base polymer.

35. The optical disk according to Claim 34,

wherein the vinyl-base polymer comprises vinyl-base polymer A containing at least one kind of proton donating atomic groups in the molecule and vinyl-base polymer B containing at least one kind of proton accepting atomic groups in the molecule, and

wherein pseudo cross-links are formed between the proton donating atomic groups and proton accepting atomic groups by intermolecular hydrogen bonds.

36. The optical disk according to Claim 35,

wherein vinyl-base polymer A is a polymer obtained by polymerization of a mixture of monomers containing a vinyl monomer having at least one functional group selected from carboxyl groups, hydroxyl groups and phenolic hydroxyl groups in the molecule, and vinyl-base polymer B is a polymer obtained by polymerization of a mixture of monomers containing a vinyl monomer having nitrogen atoms in the molecule, and

wherein either vinyl-base polymer A or vinyl-base polymer B has a glass transition temperature of 25°C or more, and the other has a glass transition temperature of less than 25°C.

37. The optical disk according to Claim 34, wherein the vinyl-base polymer is an acrylic resin.

38. The optical disk according to Claim 31, wherein the thermoplastic resin contains at least one compound selected from phenolic antioxidants, phosphite antioxidants, thioether antioxidants and light stabilizers.

39. The optical disk according to Claim 31, wherein the difference of refractive index between the light transmission layer and the adhesive layer is 0.1 or less.

40. The optical disk according to Claim 31, wherein the supporting base plate mainly comprises polycarbonate.

41. The optical disk according to Claim 31, wherein a thickness of the supporting base plate is in the range of 0.4 mm to 1.2 mm.

42. The optical disk according to Claim 31, wherein a hard coat layer with a pencil hardness of 3H or more is further formed on the light transmission layer.

43. The optical disk according to Claim 31, wherein the optical disk is a high density DVD with a recording capacity of 20 GB or more.